Solid-Phase Extraction Of Galloyl- And Caffeoylquinic Acids From Natural Sources (Galphimia Glauca and Arnica Flos) Using Pure Zirconium Silicate And Bismuth Citrate Powders As Sorbents Inside Micro Spin columns.

Shah Hussain[a], Stefan A Schönbichler[a], Yüksel Güzel[a], Gudrun Abel[b], Matthias Rainer[a], Christian W Huck[a] and Günther K Bonn[a]

[a]*Institute of Analytical Chemistry and Radiochemistry, Leopold-Franzens University, Innrain 52a, 6020 Innsbruck, Austria.*

[b]*Bionorica SE, Kerschensteinestasse: 11-15, 92318 Neumarkt Oberpfalz, Germany*

Galloyl- and caffeoylquinic acids are among the most important pharmacological active groups of natural compounds. Current study was a pre-step in isolation of some selected representatives of these groups from biological samples. A novel solid phase extraction (SPE) method for these compounds may lead to discover more sources along with novel isomers in nature. For the present study pure zirconium silicate and bismuth citrate powders (-325 mesh) as two new sorbents for SPE of phenolic acids were employed. In addition to that a selective SPE method for tetragalloylquinic acid was reported for the first time. The recovery and selectivity of our sorbents were compared to most commonly applied and commercially available sorbents by using reversed phase HPLC-PDA. Nature of interaction between the sorbent and target molecules were established by monitoring the complete profiles of stationary phases from very hydrophilic to very hydrophobic, mixed-mode (ionic and hydrophobic) and predominantly electrostatic (Silica, C18, Oasis Max and zirconium silicate sorbents respectively). It was observed that zirconium silicate showed maximum recovery and selectivity for tetragalloylquinic acid (83%), chlorogenic acid (82%) and dicaffeoylquinic acid (94%) among all of the sorbents tested. On the other hand, bismuth citrate showed promising results with tetragalloylquinic acid only. Commercially available materials showed good recoveries for caffeoylquinic acids but selectivity was low. Furthermore, commonly applied materials were found not to be suitable for selective binding of tetragalloylquininc acid. Therefore, the novel zirconium silicate and bismuth citrate stationary phases show promising results for the selective extraction of galloyl- and caffeoylquinic acids from natural sources.